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Project	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**	
Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**	
Consultant	**M/s Tejus Consultants**	
Contractor	**M/S Ram and Company, Engineers & Contractors.**	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**03.03.18**
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6276	6292
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9762	9796
Wt. of sand in cone (w3) gms.	850	830
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3388	3374
Bulk density of sand (γs)gm/cc	1.32	1.31
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.45	2.44
Moisture meter reading(moisture content)	13.00	13.20
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.16	2.16
MDD	2.20	2.20
OMC	13.20%	13.20%
% compaction obtained	98.36	98.09
% compaction required	98%	98%

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Assistant Executive Engineer
Vidyaranyapura Sub Division
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Project	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**	
Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**	
Consultant	**M/s Tejus Consultants**	
Contractor	**M/S Ram and Company, Engineers & Contractors.**	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**03.03.18**
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6298	6382
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9692	9688
Wt. of sand in cone (w3) gms.	850	850
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3458	3462
Bulk density of sand (γs)gm/cc	1.34	1.32
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.44	2.43
Moisture meter reading(moisture content)	12.96	12.84
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.16	2.16
MDD	2.20	2.20
OMC	13.20%	13.20%
% compaction obtained	98.21	98.02
% compaction required	98%	98%

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Project	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**	
Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**	
Consultant	**M/s Tejus Consultants**	
Contractor	**M/S Ram and Company, Engineers & Contractors.**	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**03.03.18**
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6280	6280
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9792	9762
Wt. of sand in cone (w3) gms.	835	842
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3373	3396
Bulk density of sand (γs)gm/cc	1.31	1.32
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.44	2.44
Moisture meter reading(moisture content)	12.96	13.10
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.16	2.16
MDD	2.20	2.20
OMC	13.20%	13.20%
% compaction obtained	98.14	98.10
% compaction required	98%	98%

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Project	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**
Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**
Consultant	**M/s Tejus Consultants**
Contractor	**M/S Ram and Company, Engineers & Contractors.**

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	At plant	**Date of Sampling**	**05.03.18**
		Date of Testing	**05.03.18**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	890	70	820	78
16.0	12.5	1160	152	1008	104
12.5	10.0	782	62	720	62
10.0	6.3	658	55	603	90
Total		**3490**	**339**	**3151**	**334**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	9.71
Elongation Index(%):	10.60
Combined FI+EL (%)	20.31

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Name of Work	:	COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors.
Date of Testing	:	05.03.18
Type of Mix	:	WMM
Sample I/D	:	WMM 3

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	At plant	**Date of Sampling:**	05.03.18
		Date of testing:	05.03.18
Type of material & Purpose:	WMM	**Oven Dry Wt.(gms):**	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	292	292	2.92	97.08	95-100
22.4	2422	2714	27.14	72.86	60-80
11.2	1812	4526	45.26	54.74	40-60
4.75	1632.0	6158	61.58	38.42	25-40
2.36	1626.0	7784	77.84	22.16	15-30
0.6	1244.0	9028	90.28	9.72	8.0-22.0
0.075	708.0	9736	97.36	2.64	0-8
Pan	264.0				
Total	10000.0				

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Project	COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.
Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	M/S Ram and Company, Engineers & Contractors.

AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Proposed Use	WMM	**Date of Sampling**	**05.03.18**
Sample Location	**At plant**	**Date of Testing**	**05.03.18**

Sl. No.	**Description**		**Test No. 1**	**Test No. 2**	**Test No. 3**	**Spec Limit (%)**
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	420.00	416.00	422.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	332.00	322.00	312.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	88.00	94.00	110.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	20.95	22.60	26.07	
5	Average Aggregate impact value	(%)	23.20			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

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Project	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**	
Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**	
Consultant	**M/s Tejus Consultants**	
Contractor	**M/S Ram and Company, Engineers & Contractors**	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**07.03.18**
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6210	6222
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9822	9823
Wt. of sand in cone (w3) gms.	850	850
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3328	3327
Bulk density of sand (γs)gm/cc	1.31	1.31
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.44	2.45
Moisture meter reading(moisture content)	13.10	13.00
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.16	2.17
MDD	2.20	2.20
OMC	13.20%	13.20%
% compaction obtained	98.24	98.55
% compaction required	98%	98%

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Project	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**	
Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**	
Consultant	**M/s Tejus Consultants**	
Contractor	**M/S Ram and Company, Engineers & Contractors.**	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**07.03.18**
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6308	6308
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9722	9712
Wt. of sand in cone (w3) gms.	850	850
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3428	3438
Bulk density of sand (γs)gm/cc	1.33	1.33
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.45	2.44
Moisture meter reading(moisture content)	12.88	12.90
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.17	2.16
MDD	2.20	2.20
OMC	13.20%	13.20%
% compaction obtained	98.55	98.25
% compaction required	98%	98%

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Name of Work	:	COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors.
Date of Testing	:	07.03.18
Type of Mix	:	WMM
Sample I/D	:	WMM 1

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	At plant	**Date of Sampling:**	07.03.18
		Date of testing:	07.03.18
Type of material & Purpose:	WMM	**Oven Dry Wt.(gms):**	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	315	315	3.15	96.85	95-100
22.4	2618	2933	29.33	70.67	60-80
11.2	2462	5395	53.95	46.05	40-60
4.75	1342.0	6737	67.37	32.63	25-40
2.36	1322.0	8059	80.59	19.41	15-30
0.6	784.0	8843	88.43	11.57	8.0-22.0
0.075	660.0	9503	95.03	4.97	0-8
Pan	497.0				
Total	10000.0				

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Project	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**
Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**
Consultant	**M/s Tejus Consultants**
Contractor	**M/S Ram and Company, Engineers & Contractors.**

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	At plant	**Date of Sampling**	**07.03.18**
		Date of Testing	**07.03.18**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	900	56	844	74
16.0	12.5	1320	132	1188	122
12.5	10.0	720	72	648	82
10.0	6.3	620	60	560	56
Total		**3560**	**320**	**3240**	**334**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	8.99
Elongation Index(%):	10.31
Combined FI+EL (%)	19.30

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Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	M/S Ram and Company, Engineers & Contractors.

AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Proposed Use	WMM	**Date of Sampling**	**07.03.18**
Sample Location	**At plant**	**Date of Testing**	**07.03.18**

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	382.00	352.00	360.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	295.00	280.00	284.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	87.00	72.00	76.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	22.77	20.45	21.11	
5	Average Aggregate impact value	(%)	21.45			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

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Project	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**	
Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**	
Consultant	**M/s Tejus Consultants**	
Contractor	**M/S Ram and Company, Engineers & Contractors**	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**09.03.18**
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6378	6422
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9722	9710
Wt. of sand in cone (w3) gms.	850	850
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3428	3440
Bulk density of sand (γs)gm/cc	1.31	1.31
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.44	2.45
Moisture meter reading(moisture content)	12.82	12.93
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.16	2.17
MDD	2.20	2.20
OMC	13.20%	13.20%
% compaction obtained	98.20	98.44
% compaction required	98%	98%

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Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**	
Consultant	**M/s Tejus Consultants**	
Contractor	**M/S Ram and Company, Engineers & Contractors**	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**09.03.18**
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6286	6302
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9782	9762
Wt. of sand in cone (w3) gms.	850	850
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3368	3388
Bulk density of sand (γs)gm/cc	1.31	1.31
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.44	2.44
Moisture meter reading(moisture content)	12.86	12.98
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.17	2.16
MDD	2.20	2.20
OMC	13.20%	13.20%
% compaction obtained	98.47	98.04
% compaction required	98%	98%

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Name of Work	:	COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors.
Date of Testing	:	09.03.18
Type of Mix	:	WMM
Sample I/D	:	WMM 2

GRADATION FOR WMM
(As per MORT&H 400-11)

Sample Location:	At plant	**Date of Sampling:**	09.03.18
		Date of testing:	09.03.18
Type of material & Purpose:	WMM	**Oven Dry Wt.(gms):**	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	372	372	3.72	96.28	95-100
22.4	2462	2834	28.34	71.66	60-80
11.2	2652	5486	54.86	45.14	40-60
4.75	1052.0	6538	65.38	34.62	25-40
2.36	1368.0	7906	79.06	20.94	15-30
0.6	986.0	8892	88.92	11.08	8.0-22.0
0.075	688.0	9580	95.80	4.20	0-8
Pan	420.0				
Total	10000.0				

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Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**
Consultant	**M/s Tejus Consultants**
Contractor	**M/S Ram and Company, Engineers & Contractors.**

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	WMM	**Proposed Use**	**WMM**
Sample Location	At plant	**Date of Sampling**	**09.03.18**
		Date of Testing	**09.03.18**

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	800	62	738	60
16.0	12.5	1100	122	978	108
12.5	10.0	500	58	442	78
10.0	6.3	600	62	538	62
Total		**3000**	**304**	**2696**	**308**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.13
Elongation Index(%):	11.42
Combined FI+EL (%)	21.56

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Project	COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.
Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	M/S Ram and Company, Engineers & Contractors.

AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Proposed Use	WMM	**Date of Sampling**	**09.03.18**
Sample Location	**At plant**	**Date of Testing**	**09.03.18**

Sl. No.	**Description**		**Test No.**			**Spec Limit (%)**
			1	**2**	**3**	
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	423.00	420.00	400.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	333.00	336.00	312.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	90.00	84.00	88.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	21.28	20.00	22.00	
5	Average Aggregate impact value	(%)	21.09			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

Consultant's Representative

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Assistant Executive Engineer
Vidyaranyapura Sub Division
BBMP, Bangalore - 97

Project	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**	
Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**	
Consultant	**M/s Tejus Consultants**	
Contractor	**M/S Ram and Company, Engineers & Contractors**	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**12.03.18**
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6362	6322
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9742	9762
Wt. of sand in cone (w3) gms.	850	850
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3408	3388
Bulk density of sand (γs)gm/cc	1.31	1.31
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.45	2.44
Moisture meter reading(moisture content)	12.90	13.20
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.17	2.16
MDD	2.20	2.20
OMC	13.20%	13.20%
% compaction obtained	98.46	98.16
% compaction required	98%	98%

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Project	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**	
Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**	
Consultant	**M/s Tejus Consultants**	
Contractor	**M/S Ram and Company, Engineers & Contractors**	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**12.03.18**
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Wt. of wet material from hole (Ww) gms.	6380	6392
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9722	9722
Wt. of sand in cone (w3) gms.	850	850
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3428	3428
Bulk density of sand (γs)gm/cc	1.31	1.31
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.44	2.44
Moisture meter reading(moisture content)	13.00	13.10
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.16	2.16
MDD	2.20	2.20
OMC	13.20%	13.20%
% compaction obtained	98.07	98.17
% compaction required	98%	98%

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Project	COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.
Client	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	M/s Tejus Consultants
Contractor	M/S Ram and Company, Engineers & Contractors

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	BC	Proposed Use	BC
Sample Location	At plant	Date of Sampling	08.03.18
		Date of Testing	08.03.18

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	Total wt. of aggregate retained on sieves (A) gms.	Wt. of aggregate passing from Flakiness gauge (B) gms	Wt. of aggregate retained on Flakiness gauge (C) gms	Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	922	102	820	76
16.0	12.5	1162	94	1068	132
12.5	10.0	720	70	650	80
10.0	6.3	600	62	538	62
Total		3404	328	3076	350

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	9.64
Elongation Index(%):	11.38
Combined FI+EL (%)	21.01

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Client	**BRUHAT BANGALORE MAHANAGARA PALIKE**
Consultant	**M/s Tejus Consultants**
Contractor	**M/S Ram and Company, Engineers & Contractors**

AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

Proposed Use	BC	**Date of Sampling**	**08.03.18**
Sample Location	At plant	**Date of Testing**	**08.03.18**

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	380.00	378.00	376.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	301.00	294.00	293.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	79.00	84.00	83.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	20.79	22.22	22.07	
5	Average Aggregate impact value	(%)	21.70			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

Consultant's Representative

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Vidyaranyapura Sub Division
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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work	:	COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors
Date of Testing	:	10.03.18
Type of Mix	:	BC
Sample I/D	:	BC1

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	906	880
2. Weight of Mixture after extraction, g	856	831
3. Weight of Bitumen	50	49
4. Weight of filter paper before extraction, g	2.00	2.00
5. Weight of filter paper after extraction, g	4.60	4.00
6. Weight of fines, g	2.60	2.00
7. Weight of Bitumen & fines	52.60	51.00
8. Bitumen content in %	5.81	5.80
9. Average Bitumen content in %	**5.80**	
10. Minimum Bitumen content in %	**5.80**	

GRADATION FOR BC AFTER EXTRACTION

(As per MORT&H 500-18,Grading-2)

Sample Location:	At site	Date of Sampling:	10.03.18
		Date of testing:	10.03.18
Type of material & Purpose:	BC	Oven Dry Wt.(gms):	856.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	92	92.0	10.75	89.25	79 - 100
9.50	118	210.0	24.53	75.47	71 - 95
4.75	92	302.0	35.28	64.72	53 - 71
2.360	120	422.0	49.30	50.70	42 - 58
1.180	130	552.0	64.49	35.51	34 - 48
0.600	76	628.0	73.36	26.64	26 - 38
0.300	52	680.0	79.44	20.56	18 - 28
0.150	45	725.0	84.70	15.30	12 - 20
0.075	62	787.0	91.94	8.06	4 - 10
Pan	69.0				
Total	856.0				

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Name of Work	:	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors
Date of Testing	:	08.03.18
Type of Mix	:	BC
Sample I/D	:	BC2

GRADATION FOR BC
(As per MORT&H 500-18,Grading-2)

Sample Location:	At plant	Date of Sampling:	08.03.18
		Date of testing:	08.03.18
Type of material & Purpose:	BC	Oven Dry Wt.(gms):	1200.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	100	100.0	8.33	91.67	79 - 100
9.50	102	202.0	16.83	83.17	71 - 95
4.75	162	364.0	30.33	69.67	53 - 71
2.360	166	530.0	44.17	55.83	42 - 58
1.180	124	654.0	54.50	45.50	34 - 48
0.600	114	768.0	64.00	36.00	26 - 38
0.300	140	908.0	75.67	24.33	18 - 28
0.150	130	1038.0	86.50	13.50	12 - 20
0.075	100	1138.0	94.83	5.17	4 - 10
Pan	62.0				
Total	1200.0				

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Name of Work	:	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors
Date of Testing	:	08.03.18
Type of Mix	:	BC
Sample I/D	:	BC2

GRADATION FOR BC
(As per MORT&H 500-18,Grading-2)

Sample Location:	At plant	Date of Sampling:	08.03.18
		Date of testing:	08.03.18
Type of material & Purpose:	BC	Oven Dry Wt.(gms):	1200.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	96	96.0	8.00	92.00	79 - 100
9.50	110	206.0	17.17	82.83	71 - 95
4.75	228	434.0	36.17	63.83	53 - 71
2.360	182	616.0	51.33	48.67	42 - 58
1.180	138	754.0	62.83	37.17	34 - 48
0.600	128	882.0	73.50	26.50	26 - 38
0.300	98	980.0	81.67	18.33	18 - 28
0.150	72	1052.0	87.67	12.33	12 - 20
0.075	114	1166.0	97.17	2.83	4 - 10
Pan	34.0				
Total	1200.0				

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Name of Work	:	**COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.**
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors
Date of Testing	:	08.03.18
Type of Mix	:	BC
Sample I/D	:	BC1

GRADATION FOR BC
(As per MORT&H 500-18,Grading-2)

Sample Location:	At plant	Date of Sampling:	08.03.18
		Date of testing:	08.03.18
Type of material & Purpose:	BC	Oven Dry Wt.(gms):	1200.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	126	126.0	10.50	89.50	79 - 100
9.50	102	228.0	19.00	81.00	71 - 95
4.75	240	468.0	39.00	61.00	53 - 71
2.360	138	606.0	50.50	49.50	42 - 58
1.180	118	724.0	60.33	39.67	34 - 48
0.600	118	842.0	70.17	29.83	26 - 38
0.300	100	942.0	78.50	21.50	18 - 28
0.150	80	1022.0	85.17	14.83	12 - 20
0.075	114	1136.0	94.67	5.33	4 - 10
Pan	64.0				
Total	1200.0				

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work	:	COMPREHENSIVE DEVELOPMENT FOR ROADS AND DRAINS IN WARD NO. 9, 10 AND 11 UNDER CMC AND TMC GRANTS, VIDYARANYAPURA SUB-DIVISION, YELAHANKA ZONE, BYATARAYANAPURA DIVISION.
Client	:	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant	:	M/s Tejus Consultants
Contractor	:	M/S Ram and Company, Engineers & Contractors
Date of Testing	:	10.03.18
Type of Mix	:	BC
Sample I/D	:	BC2

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	940	920
2. Weight of Mixture after extraction, g	888	869
3. Weight of Bitumen	52	51
4. Weight of filter paper before extraction, g	1.20	2.00
5. Weight of filter paper after extraction, g	3.70	4.50
6. Weight of fines, g	2.50	2.50
7. Weight of Bitumen & fines	54.50	53.50
8. Bitumen content in %	5.80	5.82
9. Average Bitumen content in %	**5.81**	
10. Minimum Bitumen content in %	**5.80**	

GRADATION FOR BC AFTER EXTRACTION

(As per MORT&H 500-18,Grading-2)

Sample Location:	At site	Date of Sampling:	10.03.18
		Date of testing:	10.03.18
Type of material & Purpose:	BC	Oven Dry Wt.(gms):	888.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	94	94.0	10.59	89.41	79 - 100
9.50	122	216.0	24.32	75.68	71 - 95
4.75	88	304.0	34.23	65.77	53 - 71
2.360	130	434.0	48.87	51.13	42 - 58
1.180	112	546.0	61.49	38.51	34 - 48
0.600	94	640.0	72.07	27.93	26 - 38
0.300	74	714.0	80.41	19.59	18 - 28
0.150	52	766.0	86.26	13.74	12 - 20
0.075	58	824.0	92.79	7.21	4 - 10
Pan	64.0				
Total	888.0				

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